



**HI 84502**

Titrateable Total Acidity Mini Titrator  
for Wine Analysis





## Piston Driven Pump with Dynamic Dosing

The HI 84502 incorporates dynamic dosing to provide precision titrant delivery. Dynamic dosing adjusts the amount of titrant dosed as the end point is approached for increased accuracy in end point detection.

### Piston Burette

Piston burettes provide an exceptionally reliable titrant delivery. This highly accurate dosing method is attained by combining a pulse controlled step motor with a 5 mL polypropylene syringe. The rigid and stable body of our syringe allows for less frequent pump calibration. Users no longer have to account for the changing elasticity of tubing associated with peristaltic pumps.

## More About Dynamic Dosing

With the integration of our piston burette, our titrator can adjust the volume and frequency of titrant dosed based on relative mV changes in the testing solution. This titrant delivery system is known as dynamic dosing, where titrant is delivered in larger doses at the start of the titration and smaller doses near the end point. These differences in dosing volume and frequency result in a faster titration without sacrificing accuracy. With larger doses in the beginning of the titration, the speed of the titration is increased, where smaller doses near the end point allow for more time for the titrant and analyte to react. Smaller doses also prevent the over titration of a sample and a more accurate determination of the titrant volume used.

## Application Specific pH Electrode

The HI 84502 is supplied with the HI 1048B pH electrode featuring CPS™ technology. This technology is used to prevent clogging of the reference junction.

Conventional electrodes may clog quickly in biological samples such as wine. By design, the HI 1048B pH electrode utilizes a ground glass/PTFE sleeve junction which controls a steady, predictable flow of electrolyte solution, keeping the junction open. The hydrophobic properties of PTFE repels wetness and coatings.

# HI 84502 Mini Titrator for Wine Applications

- **Piston Driven Pump with Dynamic Dosing**

This piston driven dosing pump incorporates dynamic dosing to provide highly accurate, repeatable results.

- **CAL CHECK™**

CAL CHECK alerts users to potential problems during calibration such as contaminated buffers or dirty/broken electrodes.

- **pH/mV Meter**

In addition to automatic titration, the HI 84502 can also be used as a pH/mV meter.

- **Log-on-Demand**

Log data up to 400 samples (200 for titration; 200 for pH/mV).

- **Graphic Mode/Exportable Data**

Displays in-depth data on titration, which can then be stored and exported to either a USB drive or PC using the USB connection.

- **Automatic Stirrer Speed Control**

Maintains stirrer speed at approximately 600 rpm regardless of viscosity of solution.

- **GLP Feature**

The HI 84502 includes a GLP Feature that allows users to view calibration data for the pH electrode and dosing pump.

- **Easy to use interface**

User intuitive design with large keys and easy to navigate screens.

- **pH Electrode**

The HI 84502 is supplied with the HI 1048B pH electrode. This versatile electrode is designed to be used in all types of wine related applications.



## Easy to Use, Fast and Affordable All-in-one Solution

The HI 84502 is an easy to use, fast and affordable automatic mini titrator designed for testing total acidity levels in wine. It includes a pre-programmed analysis method and uses a powerful algorithm in order to determine when the titration reaction has reached completion. The results are displayed in g/L as tartaric acid. This new generation of mini automatic titrator improves upon the titrant delivery system and measuring ranges for increased accuracy compared to previous models. The HI 84502 incorporates a precision piston driven dosing pump which allows for a highly accurate determination of the amount of titrant used. Pump calibrations performed with the provided Hanna standards, assure the accuracy of measurements.

This mini-titrator is also designed to be used as a benchtop pH/mV meter. As a pH meter, it has many features of a professional grade benchtop including automatic calibration up to 3 points with 4 available buffers, a 0.01 pH resolution, accuracy of +/- 0.01 pH, automatic temperature compensation and comprehensive GLP Data.



The GLP data includes date, time, offset, slope, and buffers used for calibration. Accuracy is always ensured with Hanna's unique Cal-Check feature, which analyzes the response of the electrode during the calibration process. Based on electrode response in the buffer, indicators are displayed on screen to alert the user of potential problems during calibration. These indicators include Buffer Contaminated, Electrode Dirty/Broken, and overall probe condition as a percentage that is based on both the offset and slope characteristic of the electrode.

The Cal-Check function not only ensures an accurate pH reading when the HI 84502 is used as a pH meter but also an accurate titration since the end point is determined by a set pH value.

## Why Titratable Total Acidity is So Important

Acids occur naturally during the growing of grapes and as part of the fermentation process. Wines show lower levels of acid when there is a hot growing season or when the grapes come from hotter regions. In the proper proportion, acids are a desirable trait and give the wine character. The three predominant acids in wine are tartaric, malic and citric, all of which are intrinsic to the grape. Tartaric acid is the principal acid in grapes and is a component that promotes a crisp flavor and graceful aging in wine. A moderate amount of a wine's acid comes from malic acid, which contributes to fruitiness. A small amount comes from citric acid. Wine also contains trace amounts of other acids. The least desirable acid in wine is acetic acid, which, when present in more than a nominal amount, gives wine a sour or vinegary aspect.

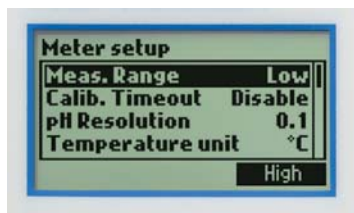
Total acidity, also called titratable acidity, is the sum of the fixed and volatile acids. In the United States the total acidity is usually expressed in terms of tartaric acid, even though the other acids are measured.

Total Acidity directly effects the color and flavor of wine and, depending on the style of the wine, is sought in a perfect balance with the sweet and bitter sensations of other components. Too much acidity makes wine tart and sharp; too little makes wines flat, flabby and uninteresting. Proper acidity in wine is what makes it refreshing and an ideal accompaniment to food. The proper acid level of a wine varies, with sweeter wines generally requiring somewhat higher levels to retain the proper balance. For sweet wine the acceptable range is 7.0 to 8.5 g/L; for dry table wine it's 6.0 to 7.5 g/L.

## All-in-One

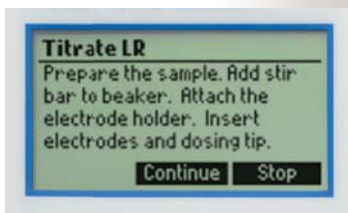
Wine Titrator, pH Meter, Electrode and Magnetic Stirrer in one package

# Features



Setup Screens

The LCD features an easy to use setup screen that allows the user to change measuring range, time, date, language and more.

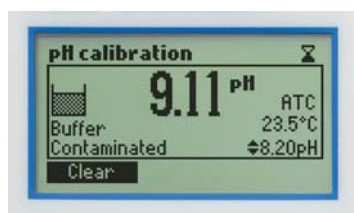


Tutorial and HELP Screens

Accessing the tutorial menu provides helpful information during calibration and titration.

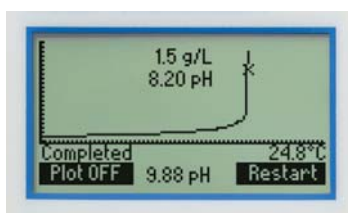
## Rear USB Outputs

For PC connection and to export data to a USB drive



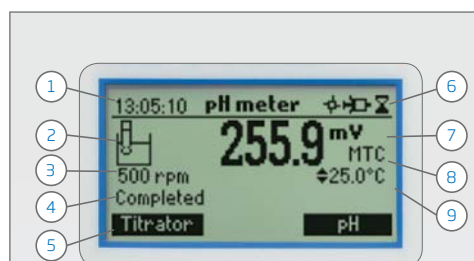
CAL CHECK™

CAL CHECK is a Hanna exclusive process for checking the condition of electrodes which helps keep measurements accurate.



Titration Curve Displayed On Screen

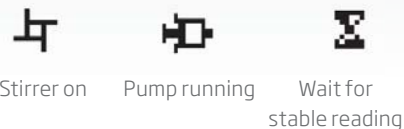
The HI 84502 offers real time graphing of the titration curve on the LCD.



## Display

- 1) Current time and instrument mode information (pH meter or Titrator)
- 2) Procedural indicators
- 3) Stirrer speed
- 4) Instrument status
- 5) Virtual option keys
- 6) Stirrer and icon status

During the instrument's operation a set of information are displayed on the LCD. Displayed icons:



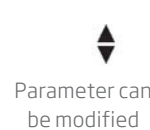
Stirrer on

Pump running

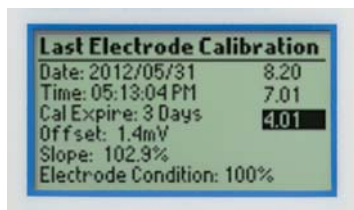
Wait for stable reading



Stirrer is not working properly

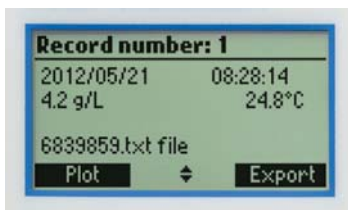


Parameter can be modified



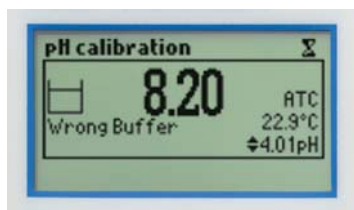
GLP

The GLP feature records electrode and pump calibration data to help keep measurements accurate and reliable.



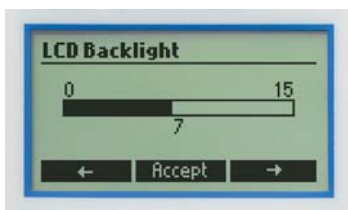
Log and Recall data

The HI 84502 can log up to 400 samples (200 for titration results; 200 for mV/pH) and recall or export data to a USB stick or PC.



Procedure Warnings

Users are warned if there is an error in procedures such as the use of a wrong buffer.



Adjustable Backlit LCD

The HI 84502 offers a backlit LCD with adjustable brightness levels. This ensures that the LCD is always easy to read.

7) Main reading information

8) pH temperature compensation mode (Manual or Automatic)

9) Temperature reading

## Specifications

## HI 84502 - Titratable Total Acidity

### Titrator

Range	Low Range: 0.1 to 5.0 g/L of tartaric acid High Range: 4.0 to 25.0 g/L of tartaric acid
Resolution	0.1 g/L
Accuracy (@25°C/77°F)	3% of reading or ± 0.1 g/L, whichever is greater
Method	Acid-base titration
Principle	End point titration: 8.20 pH
Pump speed	10 mL/min
Stirring Speed	600 rpm
Logging Data	up to 200 samples

### pH Meter

Range	-2.0 to 16.0 pH / -2.00 to 16.00 pH
Resolution	0.1 pH / 0.01 pH
Accuracy (@25°C/77°F)	±0.01 pH
Calibration	1, 2, or 3 calibration points with 4 available buffers (4.01, 7.01, 8.20, 10.01)
Temperature Compensation	manual or automatic from -20 to 120°C (-4 to 248°F)
Logging Data	Up to 200 samples (pH or mV)

### mV Meter

Range	-2000.0 to 2000.0 mV
Resolution	0.1 mV
Accuracy	± 1.0 mV
Logged Data	Up to 200 samples (pH or mV)

### Temperature

Range	-20.0 to 120.0°C (-4.0 to 248.0°F)
Resolution	0.1°C
Accuracy	±0.4°C without probe error

### Additional Specifications

pH Electrode	HI 1048B glass body, refillable with BNC connector and 1 m (3.3') cable (included)
Temperature Probe	HI 7662-T stainless steel temperature probe with 1 m (3.3') cable (included)
Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
Power Supply	12 VDC adapter (included)
Dimensions	235 x 200 x 150 mm (9.2 x 7.9 x 5.9")
Weight	1.9 kg (67.0 oz.)

## Accessories

### Reagents

HI 84502-50	Titrant solution
HI 84502-55	Calibration standard solution

### pH Calibration Solutions

HI 7004M	Buffer solution pH 4.01 (230 mL)
HI 7007M	Buffer solution pH 7.01 (230 mL)
HI 70082M	Buffer solution pH 8.20 (230 mL)
HI 7010M	Buffer solution pH 10.01 (230 mL)

### Electrode Fill and Storage Solutions

HI 7082	Electrode Fill solution (4 x 30 mL)
HI 70300L	Electrode storage solution (500 mL)

### Electrode Cleaning Solution

HI 70635L	Cleaning solution for wine deposits (500 mL)
HI 70636L	Cleaning solution for wine stains (500 mL)

### Electrodes

HI 1048B	pH Electrode
HI 7662-T	Temperature probe

### Other Accessories

HI 70500	Tube set with cap for titrant bottle, tip and valve
HI 731352	Tips for 2000 µL automatic pipette (4 pcs.)
HI 731342	Automatic pipette 2000 µL
HI 71005/8	115 Vac to 12 Vdc, 800 mA
HI 71006/8	230 Vac to 12 Vdc, 800 mA
HI 731319	Stir bar, 25 x 7 mm (10 pcs.)
HI 740036P	100 mL Beaker (10 pcs.)
HI 740236	5 mL Syringe for minititrator
HI 920013	PC Connection Cable

## Ordering Information

HI 84502-01 (115V) and HI 84502-02 (230V) are supplied with:

